Redes Generativas Adversárias

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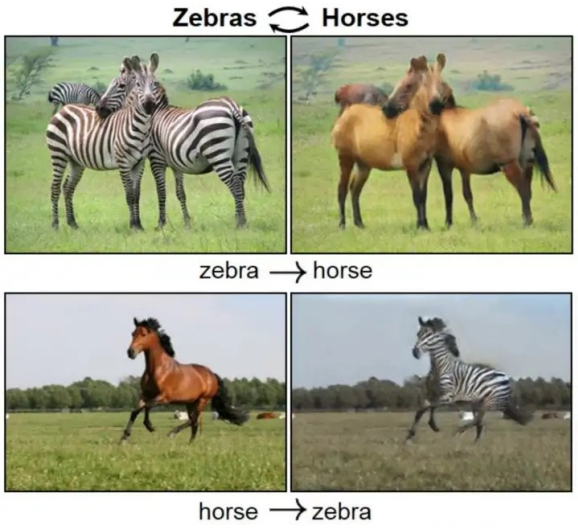
Tópicos

- DCGAN
- PIX2PIX
- Prática

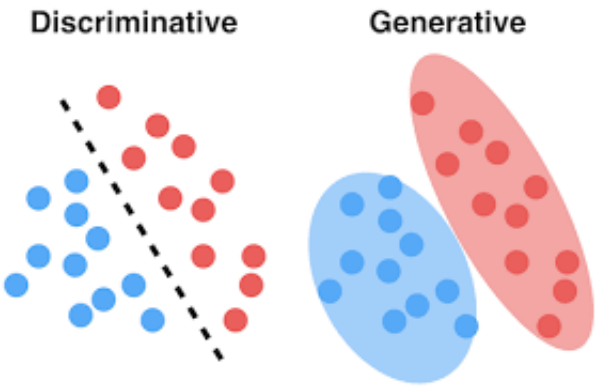
Deep Fakes

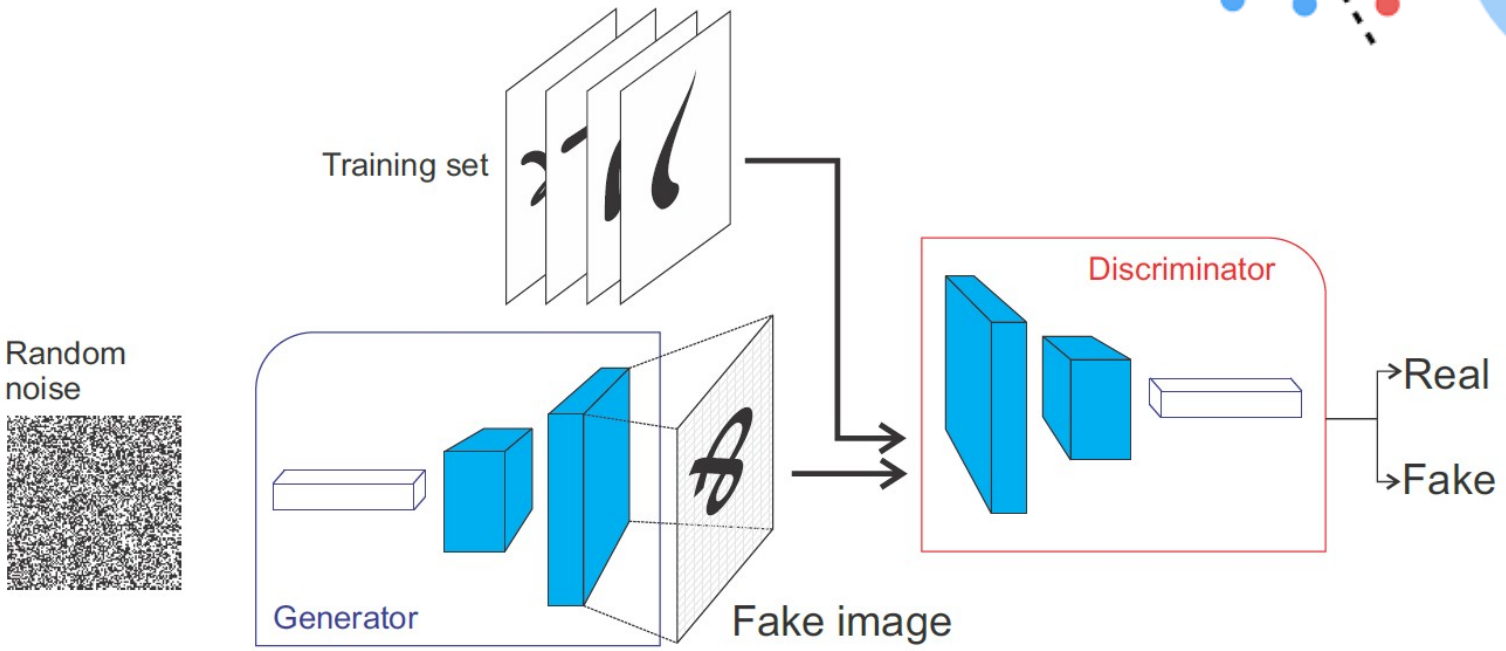
- Generalização: Dados Sintéticos gerados a partir do aprendizado da distribuição real do dado
- Aplicações
  - Filmes (Cenários Sintéticos)
  - Fotografia (Estimação de Pose, Coloração Artificial, Redução de Ruído)
  - Troca de Contexto (Zebra->Cavalo)
  - .....



Generative Adversarial Networks (GAN's)

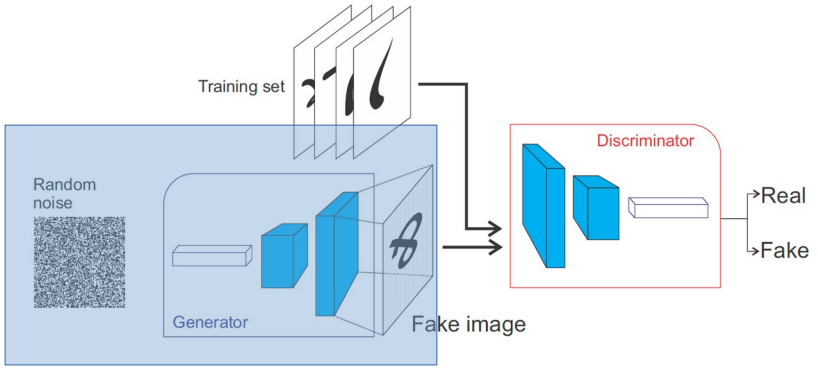
- Gerador: Ruído → Data
- Discriminador: Classificação

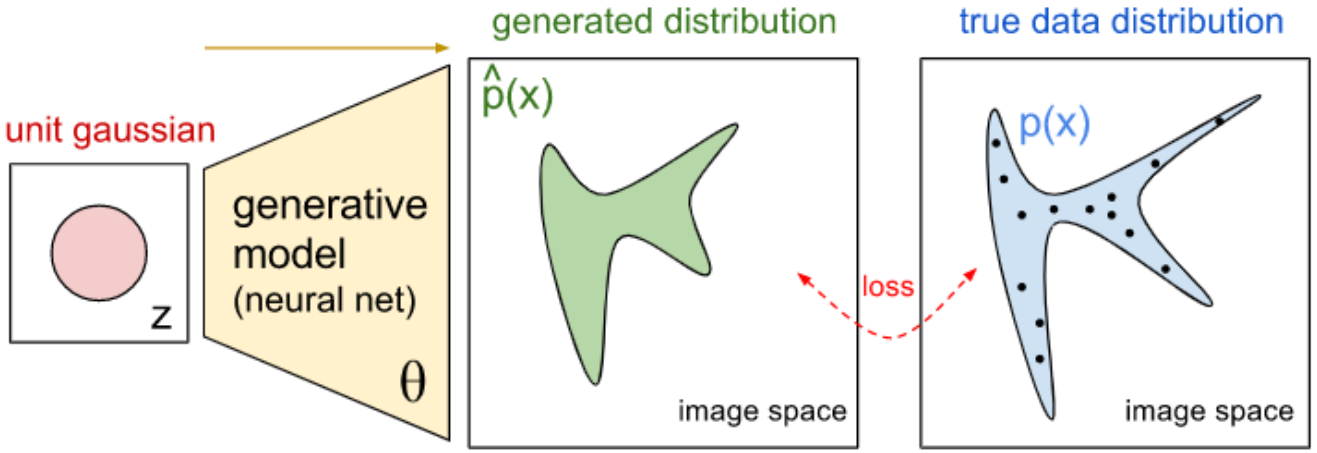




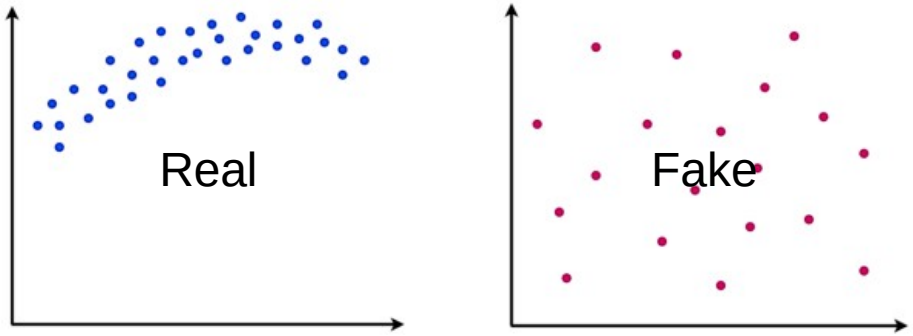
Modelo Generativo

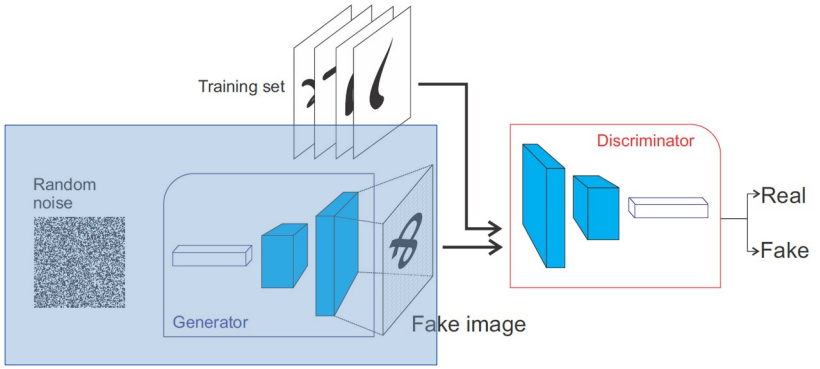
- Aprende a distribuição do dado

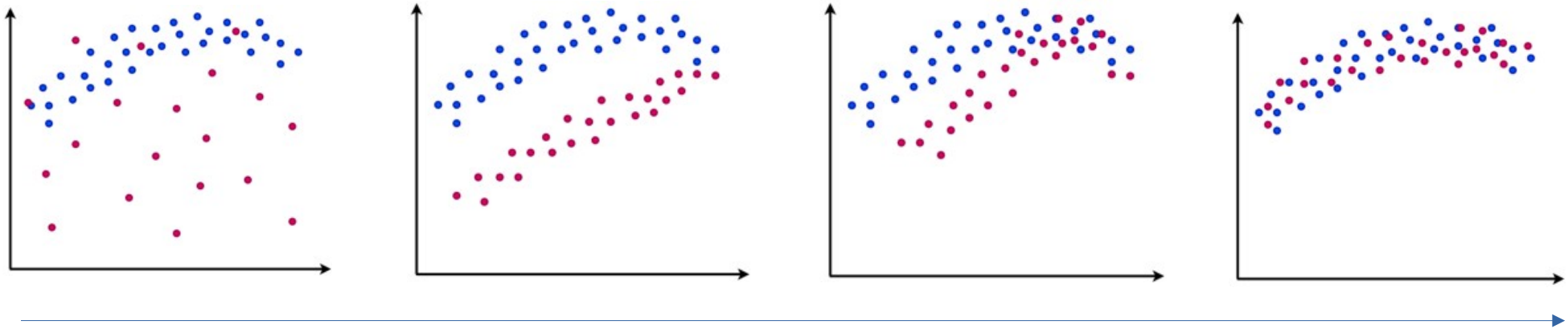




Modelo Generativo



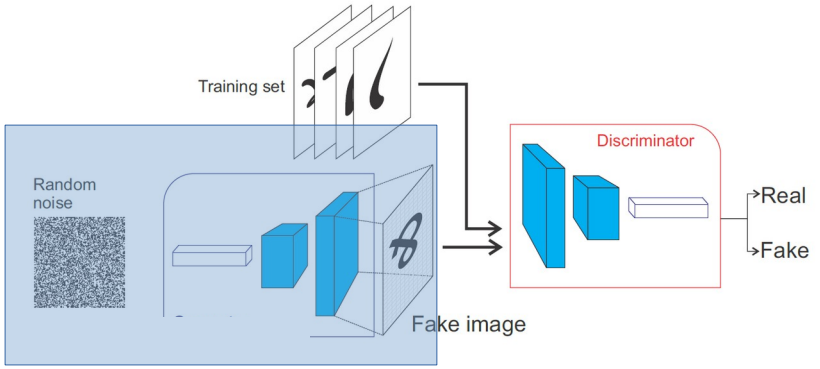


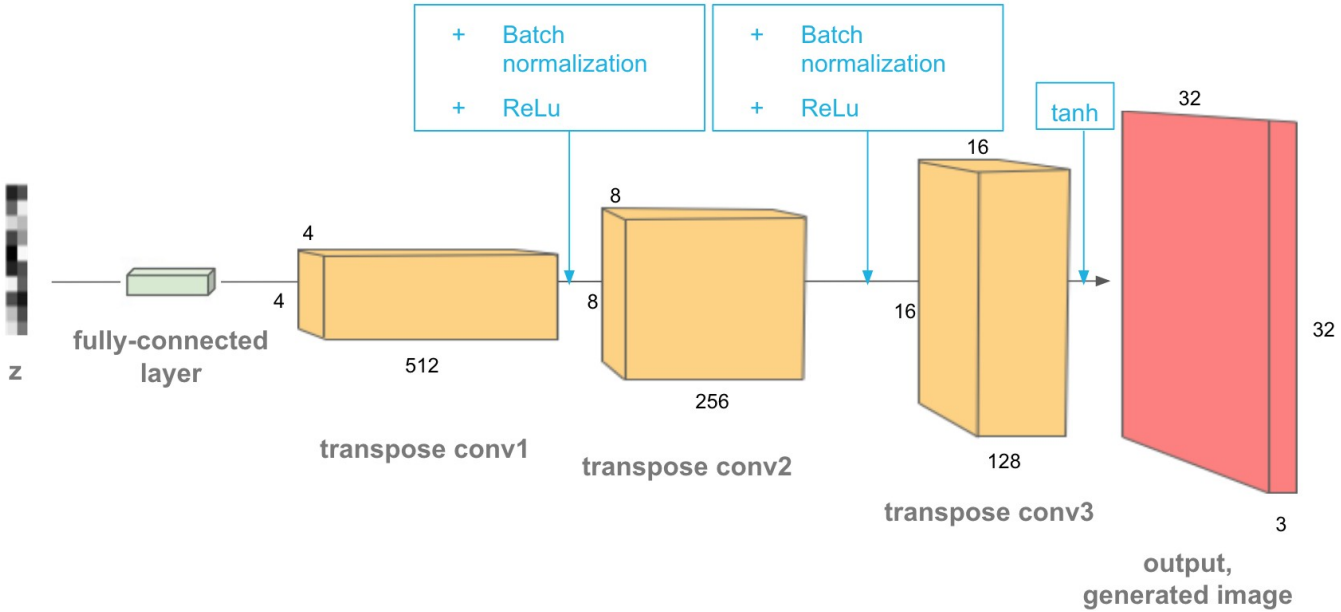


Training

Modelo Generativo Profundo

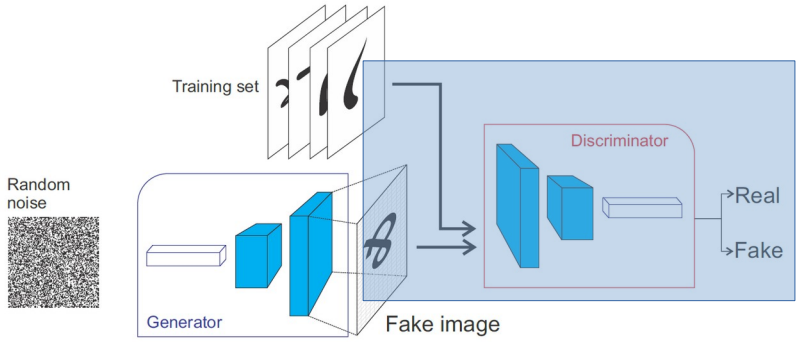
- Camadas Des-Convolucionais (upsampling)
  - Ruído → Imagens Sintéticas

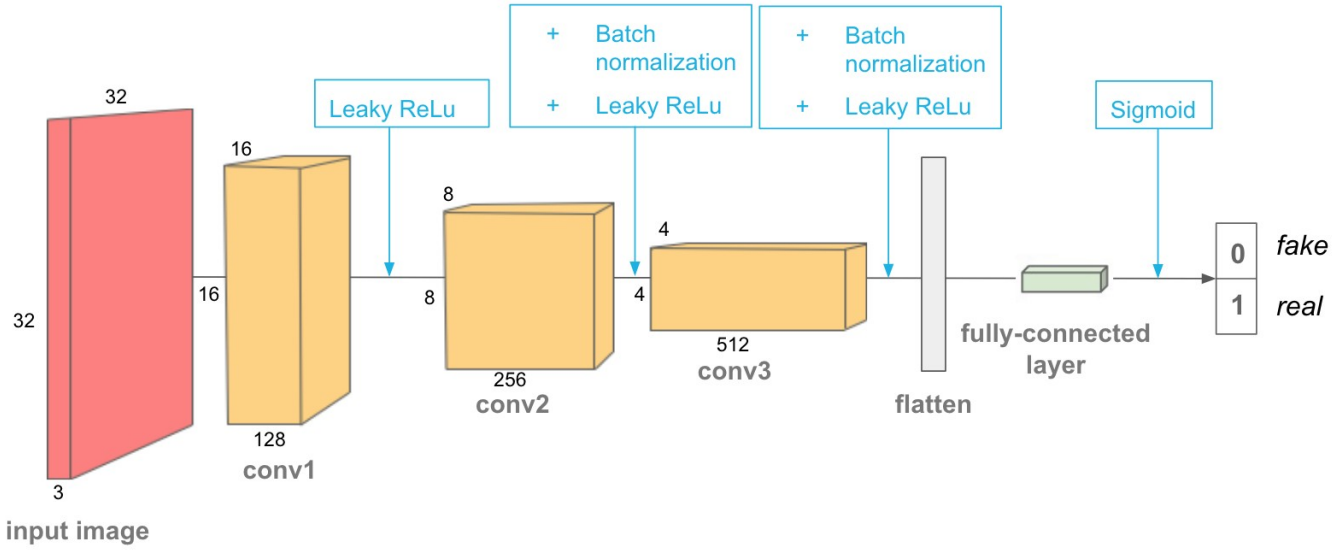




Modelo Discriminante

- Classificação: Falso ou Real ?
  - CNN

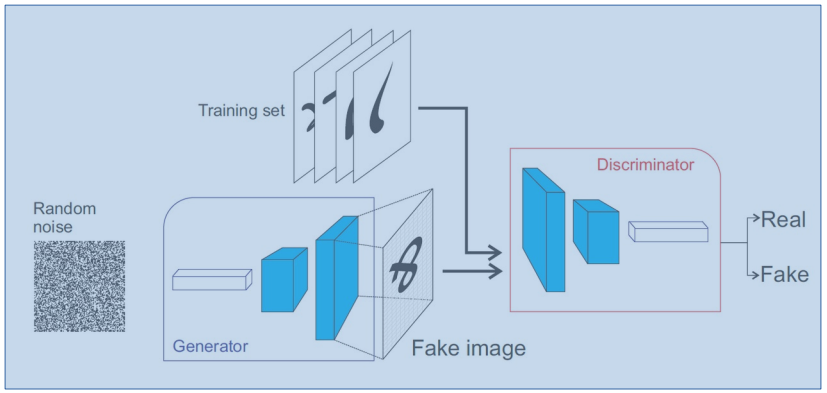


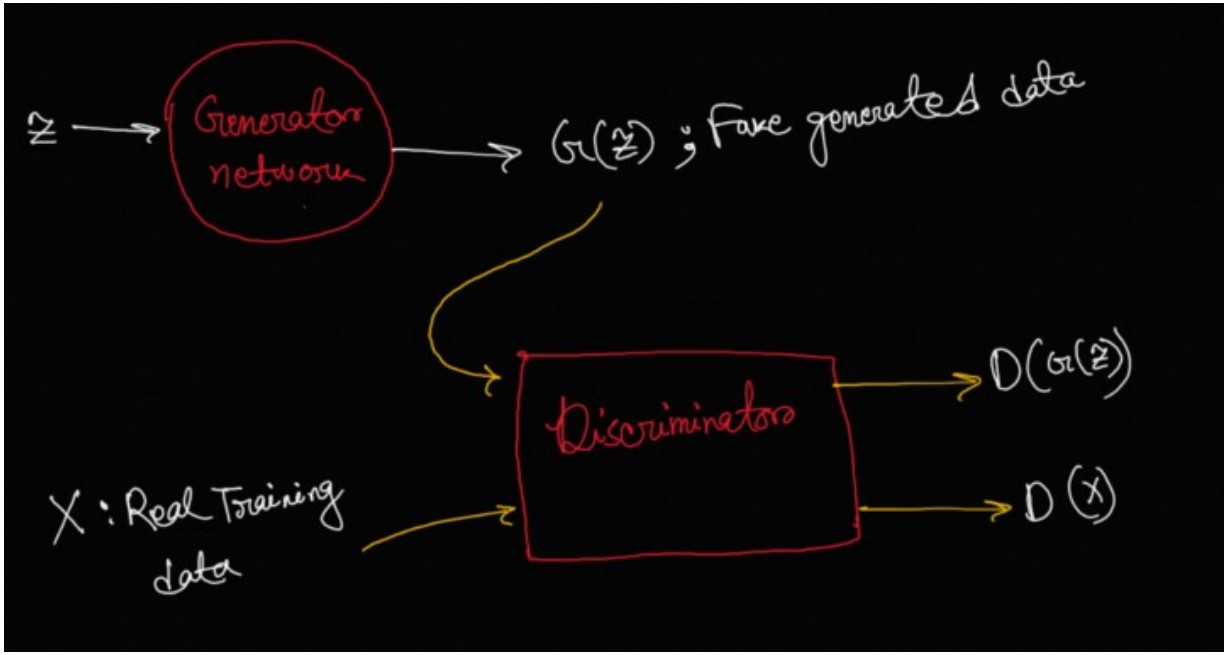


Treinamento Adversário

- Erro Adversário (Min-Max)

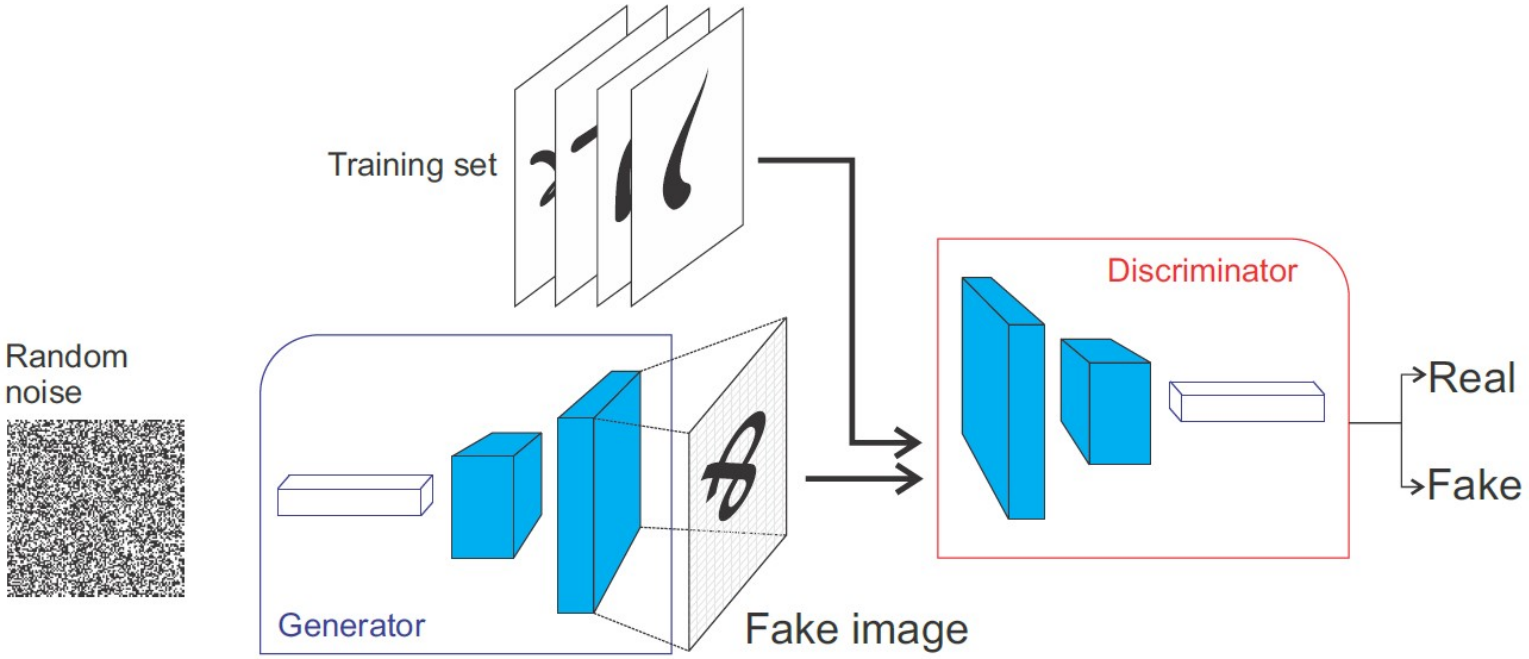
$$\min_G \max_D V(D,G) = \mathbb{E}_{x \sim p_{data}}[\log D(x)] + \mathbb{E}_{z \sim p_z(z)}[\log(1 - D(G(z)))]$$





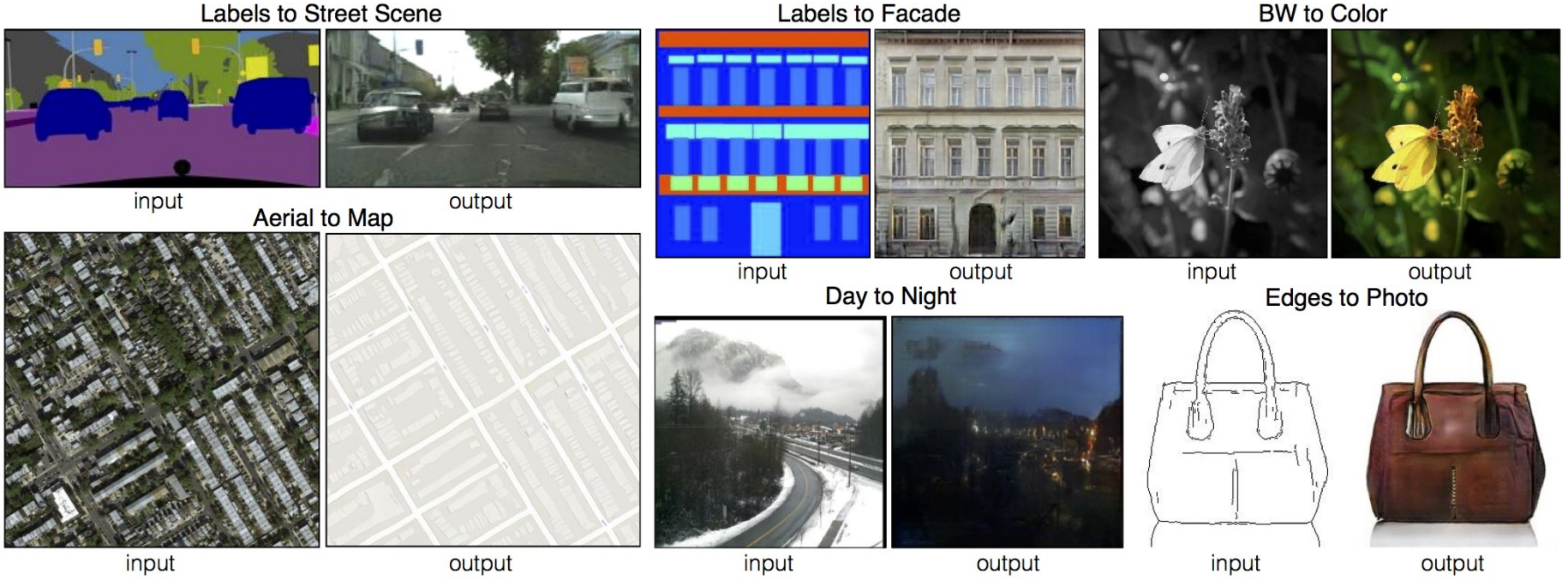
Let’s Code

- [LINK]



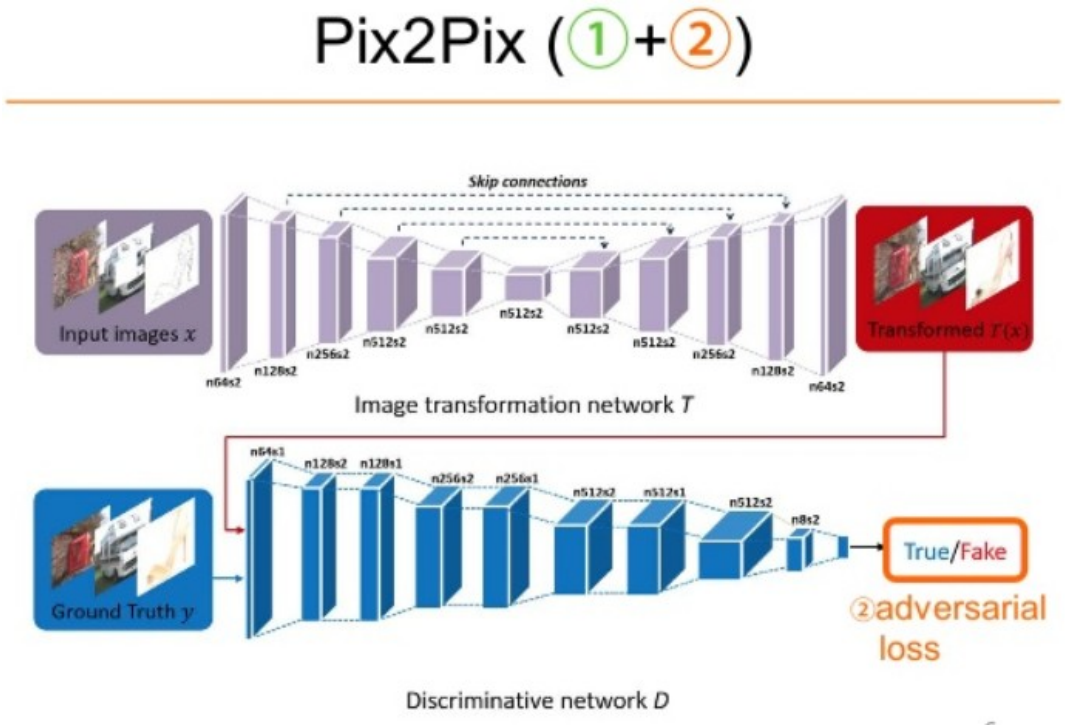
Pix2Pix

- Transformação de Contexto (Image Translation)



Pix2Pix

- Modelo Generativo: Arquitetura Encoder-Decoder (i.e U-Net)
- Base de Dados Pareada (Origem->Destino)



Let’s Code

- [LINK: Lecture_12-pix2pix.ipynb]